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| Notice of Allowability | Application No. | Applicant(s) | |
| | 10/633,534 | SUGITA ET AL. | |
| | Examiner | Art Unit | |
| | Brook Kebede | 2823 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to response filed on August 15, 2005.
2. ☒ The allowed claim(s) is/are 8,9,11 and 12.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

Brook Kebede
BROOK KEBEDE
PATENT EXAMINER

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Kenneth H. Salen on October 18, 2005.

2. The application has been amended as follows:

In the Claims:

Change claim 8 to -- A semiconductor device manufacture method comprising the sequential steps of: (c1) forming an insulating film made of zirconia or hafnia over a surface of a semiconductor substrate; (c2) covering a partial surface area of the insulating film with a mask pattern; (c3) by using the mask pattern as a mask, exposing a region of the insulating film not covered with the mask pattern pro one plasma selected from a group consisting of nitrogen plasma, argon plasma and ammonia plasma to **amorphize the insulating film not covered with the mask** ; and (c4) following said step of exposing a region of the insulating film not covered with the mask pattern to one plasma selected from a group consisting of nitrogen plasma, argon plasma and ammonia plasma, and by using the mask pattern as a mask, etching a portion of the **amorphized** insulating film.--.

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Change claim 11 to -- A semiconductor device manufacture method comprising the sequential steps of: forming an insulating film made of zirconia or hafnia over a surface of a semiconductor substrate; forming a gate electrode on a partial surface area of the insulating film; by using the gate electrode as a mask, exposing a region of the insulating film not covered with the gate electrode to one plasma selected from a group consisting of nitrogen plasma, argon plasma and ammonia plasma **amorphize the insulating film not covered with the gate electrode**; following said step of exposing a region of the insulating film not covered with the gate electrode to one plasma selected from a group consisting of nitrogen plasma, argon plasma and ammonia plasma, and by using the gate electrode as a mask, etching a portion of the **amorphized** insulating film; and by using the gate electrode as a mask, implanting impurity ions into a surface layer of the semiconductor substrate on both sides of the gate electrode.--.

Allowable Subject Matter

3. Claims 8, 9, 11 and 12 are allowed over prior art of record.

Reasons for Allowance

4. The following is an examiner's statement of reasons for allowance:

The prior art of record neither anticipates nor renders obvious the claimed subject matter of the instant application as a whole either taken alone or in combination, in particular, prior art of record does not teach "(c3) by using the mask pattern as a mask, exposing a region of the insulating film not covered with the mask pattern to one plasma selected from a group consisting of nitrogen plasma, argon plasma and ammonia plasma to **amorphize the insulating film not covered with the mask** ; and (c4) following said step of exposing a region of the insulating film not covered with the mask pattern to one plasma selected from a group consisting

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of nitrogen plasma, argon plasma and ammonia plasma, and by using the mask pattern as a mask, etching a portion of the **amorphized** insulating film, ” as recited in claim 8, “by using the gate electrode as a mask, exposing a region of the insulating film not covered with the gate electrode to one plasma selected from a group consisting of nitrogen plasma, argon plasma and ammonia plasma **amorphize the insulating film not covered with the gate electrode**; following said step of exposing a region of the insulating film not covered with the gate electrode to one plasma selected from a group consisting of nitrogen plasma, argon plasma and ammonia plasma, and by using the gate electrode as a mask, etching a portion of the **amorphized** insulating film,” as recited in claim 11, and “by using the mask pattern as a mask, implanting ions into a region of the insulating film not covered with the mask pattern to transform the region of the insulating film not covered with the mask pattern to an amorphous state; and following said step of implanting ions into a region of the insulating film not covered with the mask pattern to transform the region to an amorphous state, and by using the mask pattern as a mask, etching a portion of the insulating film by using mixture liquid of sulfuric acid and hydrogen peroxide,” as recited in claim 12 respectively.

Claim 8 also allowed as being dependent of the allowed independent base claim.

Conclusion

5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”


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Correspondence

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brook Kebede whose telephone number is (571) 272-1862. The examiner can normally be reached on 8-5 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Brook Kebede
Examiner
Art Unit 2823

BK
October 20, 2005